

RO4835IND™ LoPro® Laminate Data Sheet

High Frequency Circuit Materials

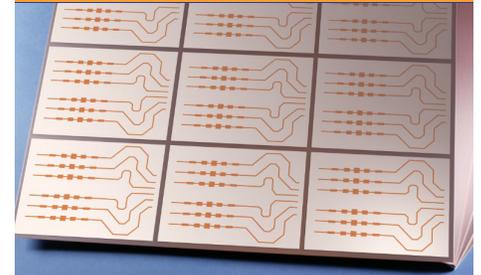
RO4835IND™ LoPro® thermoset laminates are specially designed for 60-81 GHz short range (<30m) industrial radar applications, where excellent electrical performance and cost-efficiency are equally important. RO4835IND LoPro laminates also provide environmental reliability and interconnection stability which are critical criteria for PCB material selection.

RO4835IND LoPro laminates have a low insertion loss at 60 GHz of 2.13dB/inch to meet customers critical radar coverage requirement. Meanwhile, expanded weave fiber provides excellent Dk uniformity and Rogers' tight quality control provides low Dk variation from lot to lot. RO4835IND LoPro laminates are compatible with standard epoxy/glass (FR-4) processes and have a higher fabrication yield rate compared to conventional PTFE-based laminates. Both low material and fabrication cost make RO4835IND LoPro laminates a cost-effective solution for industrial radar.

RO4835IND LoPro laminate's low water absorption results in little change in RF performance through environmental exposure. Its robust peel strength after thermal processes and superior dimensional stability brings excellent interconnection stability.

This product is offered in dielectric thickness of 0.004" and panel size of 24x18", 24x21" and 48x36" for customers' best utility rates. RO4835IND LoPro laminates are suitable for both cap layer on multilayer FR-4 board design or inner layers for multi-layer design. RO4835IND LoPro laminates are compatible with SpeedWave™ 300P Prepreg, 2929 Bondply, RO4450T™ prepreg, RO4450F™ prepreg and FR-4 prepreg. These laminates have the UL-V0 flame retardant rating and are lead free solder process compatible.

Data Sheet



Features and Benefits

Reverse treated smooth LoPro® copper foil

- Excellent insertion loss

Expanded weave fiber and good quality control

- Excellent Dk uniformity
- Excellent Dk and thickness consistency

High fabrication yield rate

- Rigid resin to minimize scratching, pits and contamination

Reliable interconnection stability

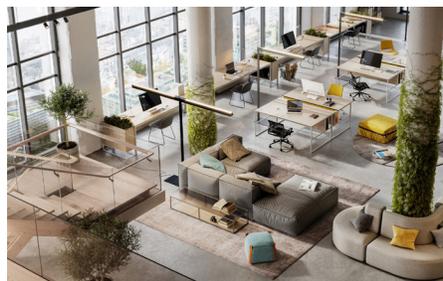
- Robust peel strength through thermal exposure

RO4000® series thermoset platform

- Reduced overall cost of PCB manufacturing versus PTFE laminate options

Typical Applications:

- 60 to 81 GHz Industrial Radar



Property	Typical Value	Direction	Units	Condition	Test Method
RO4835IND LoPro					
Dielectric Constant, ϵ_r , Process	3.48 ± 0.05	Z	--	10 GHz/23°C	IPC-TM-650 2.5.5.5 (1)Clamped Stripline
Dissipation Factor tan, δ	0.0037 0.0031	Z	--	10 GHz/23°C 2.5 GHz/23°C	IPC-TM-650 2.5.5.5
(2) Dielectric Constant, ϵ_r , Design	3.49			77 GHz	Microstrip differential phase length
Transmission Line Loss	2.75		dB/in	77 GHz	Microstrip differential phase length
Dielectric Constant, ϵ_r , Design	3.48			60 GHz	Microstrip differential phase length
Transmission Line Loss	2.13		dB/in	60 GHz	Microstrip differential phase length
Dimensional Stability	<0.5	X,Y	mm/m (mils/inch)	after etch +E2/150°C	IPC-TM-650 2.4.39A
Tg	>280		°C TMA	A	IPC-TM-650 2.4.24.3
Td	390		°C TGA		ASTM D3850
Moisture Absorption	0.05		%	48 hrs immersion 0.060" sample Temperature 50°C	ASTM D570
Copper Peel Strength	0.88 (5.0)		N/mm (pli)	after solder float 1 oz. EDC Foil	IPC-TM-650 2.4.8
Flammability	V-0				UL 94
Lead-Free Process Compatible	Yes				

Standard Thickness	Standard Panel Sizes	Standard Cladding
0.0040" (0.102mm) +/- 0.0007"	12" X 18" (305 X 457 mm) 24" X 18" (610 X 457 mm) 24" X 36" (610 X 915 mm) 48" X 36" (1219 X 915 mm)	<u>LoPro Reverse Treated Electrodeposited Copper Foil</u> ½ oz. (18µm) TH/TH
*Contact Customer Service or Sales Engineering to inquire about additional available product configurations	*Additional panel sizes available	

NOTES:
 (1) The IPC clamped stripline method can potentially lower the actual dielectric constant due to presence of airgaps between the laminates under test and the resonator card. Dielectric constant in practice may be higher than the values listed.
 (2) The design Dk is an average number from several different tested lots of material and on the most common thickness/s. If more detailed information is required, please contact Rogers Corporation. Refer to Rogers' technical paper "Dielectric Properties of High Frequency Materials" available at <http://www.rogerscorp.com>
 Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation.

Prolonged exposure in an oxidative environment may cause changes to the dielectric properties of hydrocarbon based materials. The rate of change increases at higher temperatures and is highly dependent on the circuit design. Although Rogers' high frequency materials have been used successfully in innumerable applications and reports of oxidation resulting in performance problems are extremely rare, Rogers recommends that the customer evaluate each material and design combination to determine fitness for use over the entire life of the end product. The information in this data sheet is intended to assist you in designing with Rogers' circuit materials. It is not intended to and does not create any warranties express or implied, including any warranty of merchantability or fitness for a particular purpose or that the results shown on this data sheet will be achieved by a user for a particular purpose. The user should determine the suitability of Rogers' circuit materials for each application.
 These commodities, technology and software are exported from the United States in accordance with the Export Administration regulations. Diversion contrary to U.S. law prohibited.
 RO4000, LoPro, RO4450T, RO4450F, SpeedWave, the Rogers' logo and RO4835IND are trademarks of Rogers Corporation or one of its subsidiaries.
 © 2022 Rogers Corporation, Printed in U.S.A., All rights reserved. Revised 1599 080422 **Publication #92-206**